AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1 (canceled)

2. (currently amended) An apparatus according to Claim 18 wherein said sequencer queues said work units to be communicated to said RIPs and further wherein individual ones of said raster image processors draw from said queued work units related to an individual page, generated data signals are communicated in said transport protocol over said plurality of RIP-to-head driver networks to a print head driver and wherein each color print head driver is on a dedicated print head driver network and black print head drivers are on a pair of dedicated print head driver networks.

3. (currently amended) An apparatus according to Claim 17 wherein each of said RIPs converts said work units from said transport protocol a form communicated as a print data stream to data signals over one of said RIP-to-head driver networks to a print head driver.

4. (currently amended) An apparatus according to Claim 3 wherein each print head driver is on a dedicated print head driver network and each of said RIPs converts data from said transport protocol a form communicated as a print data stream into a variable number of portions depending upon whether an individual page is to be blank or to be printed with a single color or to be printed with multiple colors.

5 (canceled)

6. (currently amended) A method comprising the steps of:

receiving at a computer a print data stream from a print server and parsing the stream into local and global portions;

packaging together parsed local and global print stream data portions <u>in a transport protocol</u>;

queuing packaged print stream data portions in said computer;

communicating queued packaged print stream data portions <s>directly</s> over a <u>commercially available</u> network to a plurality of personal computers operating as raster image processors (RIPs);

processing a plurality of communicated packaged print stream data portions in parallel in said plurality of personal computers to generate print head driving data signals; and

communicating <u>in said transport protocol</u> the generated print head driving data signals from each of said plurality of personal computers to one or more of a plurality of print head driver computers, said print head driver computers driving print heads of a printer.

7. (currently amended) A method according to Claim 6 wherein each print head driver is on a dedicated print head driver network<u>,</u> [[and]] said step of packaging print stream data portions comprises packaging portions applicable to individual pages <u>in said transport protocol and each said dedicated print head driver network is a commercially available network</u>.

8. (currently amended) A method according to Claim 6 wherein said step of processing comprises generating bit map data signals and wherein color bitmaps are communicated <u>in said transport protocol</u> for each color on a dedicated print head driver network and black bitmaps are communicated <u>in said transport protocol</u> on a pair of dedicated print head driver networks <u>and each said dedicated print head driver network is a commercially available network</u>.

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9. (currently amended) A computer program product comprising a non-transitory computer readable medium with program instructions stored thereon and effective when distributed amongst a plurality of computer systems and executed by the computer systems to cause the computer systems to:

receive a print data stream at a first computer from a print server and in the first computer parse the stream into local and global portions;

package together parsed local and global print stream data portions in a transport protocol;

queue in the first computer packaged print stream data portions;

communicate in said transport protocol queued packaged print stream data portions ~~directly~~ to a plurality of raster image processors (RIPs);

process in the RIPs a plurality of communicated packaged print stream data portions in parallel to generate print head driving data signals; and

communicate in said transport protocol the generated print head driving data signals from each of the RIPs to one or more of a plurality of print driver computers driving print heads of a printer.

10 – 13 (canceled).

14. (currently amended) An apparatus comprising:

a pipeline of processors processing print control data and having:

one processor being a sequencer receiving a print data stream at an input port, said sequencer monitoring data flows among the pipelined processors and parsing a print data stream into local data portions related to individual pages and global state data portions related to characteristics shared across a plurality of pages, said sequencer packaging together parsed page local and global state data portions in a transport protocol as work units;

a plurality of raster image processors (RIPs) ~~directly~~ connected to said sequencer on one or more sequencer-to-page networks with said sequencer, each

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RIP receiving work units from said sequencer, said raster image processors processing work units in parallel and generating data signals; and

a plurality of said processors providing a plurality of print head drivers communicating over a plurality RIP-to-head driver networks with said plurality of RIPs as directed by said sequencer, said sequencer synchronizing print jobs traversing said pipeline, each of said print head drivers receiving control data signal controlling application of colorant to a sheet by a print head;

wherein said one or more sequencer-to-page networks and said plurality of RIP-to-head driver networks are <u>commercially available</u> bidirectional networks.

15. (previously presented) An apparatus according to Claim 14, wherein a plurality of said processors in said pipeline are stand alone computers.

16. (previously presented) An apparatus according to Claim 15, wherein said plurality of processors includes a plurality of personal computers.

17. (previously presented) An apparatus according to Claim 16, wherein said plurality of RIPs includes a plurality of commercial, off the shelf (COTS) personal computers operating as RIPs.

18. (previously presented) An apparatus according to Claim 17, wherein said sequencer maintains a queue of said work units, coordinates print jobs in said pipeline and is a higher performance computer than any of said plurality of COTS personal computers, said sequencer acting as one or more of said RIPs, said RIPs requesting work when ready, accessing said queue and obtaining one or more work unit for processing.

19. (currently amended) An apparatus according to Claim 16, wherein <u>said transport protocol is transmission control protocol (TCP) and</u> each of said plurality of RIPs is a personal computer, the number of RIPs being adjusted by adding and removing RIP

personal computers to/from said one or more sequencer-to-page networks and said
plurality of RIP-to-head driver networks.

20. (currently amended) An apparatus comprising:

a pipeline of computers processing print control data and connected between a
print server and a printer and processing print control data from said print server, and said
pipeline of computers having:

a sequencer computer receiving a print data stream at an input port, said
sequencer computer monitoring data flows among the pipelined computer and
parsing a print data stream into local data portions related to individual pages and
global state data portions related to characteristics shared across a plurality of
pages, said sequencer packaging together parsed page local and global state data
portions in a transport protocol as work units;

a plurality of raster image processors (RIPs) ~~directly~~ connected to said
sequencer computer on one or more sequencer-to-page networks ~~with said~~
~~sequencer computer~~, wherein said plurality of RIPs is a plurality of personal
computers each receiving work units in said transport protocol from said
sequencer, said plurality of RIPs processing work units in parallel and generating
data signals; and

a plurality of print head driver computers communicating in said transport
protocol over a plurality of RIP-to-head driver networks with said plurality of
RIPs as directed by said sequencer computer, said sequencer computer
synchronizing print jobs traversing said pipeline, each of said print head drivers
receiving control data signal controlling application of colorant to a sheet by a
print head;

wherein a plurality of said computers are stand alone computers and said
on one or more sequencer-to-page networks and said plurality of RIP-to-head
driver networks are commercially available bidirectional networks.

21. (currently amended) An apparatus according to Claim 20, wherein said plurality of computers comprises a plurality of commercial, off the shelf (COTS) personal computers and said transport protocol is transmission control protocol (TCP).

22. (previously presented) An apparatus according to Claim 21, wherein said sequencer computer maintains a queue of said work units, coordinates print jobs in said pipeline and is a higher performance computer than any of said plurality of COTS personal computers, said RIPs requesting work when ready, accessing said queue and obtaining one or more work unit for processing.

23. (previously presented) An apparatus according to Claim 21, wherein each of said plurality of RIPs is a COTS personal computer, the number of RIPs being adjusted by adding and removing RIP personal computers to/from said one or more sequencer-to-page networks and said plurality of RIP-to-head driver networks.

24. (previously presented) An apparatus according to Claim 21, wherein each print head driver is on a dedicated print head driver network and said sequencer acts as one or more RIP.

25. (new) A method according to claim 6 wherein said transport protocol is transmission control protocol (TCP).

26. (new) A computer program product according to claim 9 wherein said transport protocol is transmission control protocol (TCP).